largest values of the greatest daily ranges were: Miles City, 51; Carson City, 48; Pueblo, 47; Havre, Williston, Bismarck, Sioux City, and Northfield, 46. The smallest values were: Tatoosh Island, 12; Point Reyes Light, Nantucket, and Block Island, 14; Key West, 15; East Clallam, 16.

Among the *extreme monthly ranges* the largest were: Carson City, 72; Omaha and Lincoln, 70; Sioux City, 65; Columbus, Mo., 64; Moorhead, Huron, and Pueblo, 63; Des Moines, Springfield, Fort Smith, and Nashville, 62; Dodge City, 61; Rapid City and Springfield, Ill., 60. The smallest values were: Tatoosh Island, 18; Seattle, 20; Point Reyes Light, 22; Pysht, Astoria, and Key West, 24; Port Angeles and Woods Hole, 25; Fort Canby, Block Island, and Nantucket, 26.

Accumulated monthly departures from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column for comparison with the departures of current conditions of vegetation from the normal condition.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
	°	°		°	°
New England	+ 1.6	+ 0.8	Middle Atlantic	— 1.7	— 0.8
West Gulf	+ 1.6	+ 0.8	South Atlantic	— 2.8	— 1.4
Lower Lake	+ 0.5	+ 0.2	Florida Peninsula	— 0.5	— 0.2
Upper Lake	+ 6.7	+ 3.4	East Gulf	— 3.3	— 1.6
North Dakota	+ 2.8	+ 1.4	Ohio Valley and Tenn.	— 0.9	— 0.4
Upper Mississippi Valley	+ 3.8	+ 1.9	Southern Plateau	— 1.3	— 0.6
Missouri Valley	+ 7.7	+ 3.8	Middle Plateau	— 0.3	— 0.2
Northern Slope	+ 4.4	+ 2.2	Middle Pacific	— 0.5	— 0.2
Middle Slope	+ 2.8	+ 1.4			
Southern Slope	+ 0.4	+ 0.2			
Northern Plateau	+ 9.6	+ 4.8			
North Pacific	+ 3.0	+ 1.5			
South Pacific	+ 0.4	+ 0.2			

MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by the weight of the vapor coexisting with the air contained in a cubic foot of space, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-point for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, is given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer. The mean wet-bulb temperature is now published in Table I; it is always intermediate, and generally about half way between the temperature of the air and of the dew-point. The quantity of water evaporated from the muslin surface may be considered as depending essentially upon the wet-bulb temperature, the dew-point, and the wind.

The *relative humidity*, or the ratio between the moisture that is present in the air and the moisture that it would contain if saturated at its observed temperature is given in Table I as deduced from the 8 a. m. and 8 p. m. observations. The general average for a whole day or any other interval would properly be obtained from the data given by an evaporometer, but may also be obtained, approximately, from frequent observations of the relative humidity.

PRECIPITATION.

[In inches and hundredths.]

The *distribution of precipitation* for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The total precipitation for the current month exceeded 10 inches on the immediate coast of northern California, Washington, and Oregon, and was between 10 and 20 inches at high stations on the Sierra Nevada. An average of 3 inches fell over New England, and from 4 to 10 inches over the Middle and South Atlantic States. From 8 to 12 inches fell in western Florida and southern Louisiana, Mississippi, and Alabama. The larger for regular stations were: Astoria, 12.89; Eureka, 11.23; Tatoosh Island, 11.16; Pensacola, 10.26; Fort Canby, 10.24. Canada: St. Johns, N. F., 5.85.

Details as to *excessive precipitation* for February are given in Tables XI and XII.

The *years of greatest and least precipitation* for February are given in the REVIEW for February, 1890. The precipitation for the current month was the greatest on record at: Astoria, 12.89; Pensacola, 10.26; Columbia, S. C., 9.11; Augusta, 8.57; Lynchburg, 7.84; Kittyhawk, 7.72; Parkersburg, 7.04; Tampa, 5.40; Jupiter, 5.14; Carson City, 4.30; Salt Lake City, 3.87; Fresno, 2.65; Dodge City, 2.38; Pueblo, 1.47; Williston, 1.10. It was the least on record at: Abilene, 0.02; Corpus Christi, 0.06; San Antonio, 0.15; Palestine, 0.29.

The *diurnal variation*, as shown by tables of hourly means of the total precipitation, deduced from self-registering gauges kept at the regular stations of the Weather Bureau, is not now tabulated.

The *current departures* from the normal precipitation are given in Table I, which shows that precipitation was in excess throughout the South Atlantic and east Gulf States, as well as, to a less extent, over the Rocky Mountain Plateau region. It was decidedly in excess on the Pacific Coast. It was deficient in the Mississippi and lower Missouri valleys and the Lake Region. The large excesses were: Pensacola, 6.4; Savannah, 5.8; Astoria, 5.2; Eureka, 5.1; Columbia, S. C., 4.9; in Canada, Port Stanley, 0.3; Swift Current and Qu'Appelle, 0.1. The large deficits were: Shreveport, 3.7; Little Rock, 3.6; Fort Smith, 3.2; in Canada, Yarmouth, 3.5; Charlottetown, 2.1; Quebec, 1.4.

The *average departure* for each district is given in Table I. By dividing each current precipitation by its respective normal the following corresponding percentages are obtained (precipitation is in excess when the percentage of the normal exceeds 100):

Above the normal: Middle Atlantic, 121; south Atlantic, 188; Florida Peninsula, 163; east Gulf, 127; Ohio Valley and Tennessee, 114; North Dakota, 215; northern Slope, 138; middle Slope, 162; middle Plateau, 240; northern Plateau, 134; north Pacific, 122; middle Pacific, 151; south Pacific, 169.

Below the normal: New England, 64; west Gulf, 22; lower Lake, 60; upper Lake, 80; upper Mississippi, 84; Missouri Valley, 86; southern Slope, 25; southern Plateau, 67.

The *total accumulated monthly departures* from January 1 to the end of the current month are given in the second column of the following table: The third column gives the percentage of the current accumulated precipitation relative to its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
	Inches.	*Per ct.*		*Inches.*	*Per ct.*
South Atlantic	+ 1.00	113	New England	— 1.70	78
Florida Peninsula	+ 0.70	110	Middle Atlantic	— 1.00	88
North Dakota	+ 1.00	172	East Gulf	— 0.60	94
Upper Mississippi Valley	+ 1.50	142	West Gulf	— 1.60	77
Missouri Valley	+ 1.50	200	Ohio Valley and Tenn.	— 0.90	89
Middle Slope	+ 0.60	136	Lower Lake	— 1.10	80
Southern Plateau	+ 1.30	213	Upper Lake	— 1.10	82
Middle Plateau	+ 1.20	140	Northern Plateau	— 0.40	90
South Pacific	+ 2.30	154	North Pacific	— 0.70	95
Northern Slope	0.00	100	Middle Pacific	— 0.50	95
Abilene (southern Slope)	0.00	100			

SNOWFALL.

The *total monthly snowfall* at each station is given in Tables I and II; its geographical distribution is shown on Chart V. This chart also shows the isotherms of minimum 32° and of minimum 40° for the air within the ordinary thermometer shelter. The former isotherm is an approximate limit to possible snow, while the latter is an approximate southern limit to the regions that report frost in exposed localities.

Snowfalls of from 10 to 20 inches were reported from New England and the hilly portions of the Middle Atlantic States; from 5 to 15 inches prevailed over the Lake Region, the upper Mississippi and lower Missouri valleys. Heavy snowfall occurred in the Rocky Mountain and Sierra Nevada ranges, the heaviest reported were 239 inches at Ruby, Colo., 102 at Cisco, Cal., and 112 at Cascade Tunnel, Wash.

On the February weather map of the Canadian service the director, Prof. R. F. Stupart, says: "The precipitation throughout Canada was everywhere below the average."

The *depth of snow on the ground* at the end of the month is given in detail in Table II, and for the winter months is shown on Chart VI; it is also given on the weekly charts of the Climate and Crop Service, published by the Weather Bureau during December to March, inclusive.

In general, at the close of the month there was about 15 to 20 inches in the interior of New England, central New York, upper Michigan; 15 to 35 in western Wisconsin, southern Minnesota; 25 to 50 in northern Minnesota and the eastern portions of North and South Dakota. Heavy snow also lay on the mountains of Colorado, California, Nevada, Idaho, Washington and Oregon.

"In British Columbia the depth is at most points less than at the same date last year: Barkerville, 20 inches; Glacier House, 72; Revelstoke, 36; Donald, 36; from Kamloops to the coast, along the line of the Canadian Pacific, none. In the Northwest Territories, last year, there was only a thin coating on the prairies, but this year the amount was very considerable, Edmonton and Battleford, 16 inches on the level, and Qu'Appelle, 29; in Manitoba the amount is much greater than a year ago, Minnedosa, 34 inches on a level; Winnipeg, 18. In the Lake Superior district the amount is about the same as it was last year, but from Lake Huron eastward somewhat less, except in the extreme portions of Ontario and the Maritime Provinces, where it is slightly greater."

ICE.

The *thickness of ice* in the rivers and harbors is shown in detail in the bulletins published every Monday by the Weather Bureau, and is also given in some detail in the chapter on "River and Flood Service." The more prominent characteristic data for the first and last Mondays, February 1 and 22, respectively, are:

Connecticut, Middletown, 6 and 4 inches; Iowa, Dubuque, 13 and 9, Sioux City, 19 and 19; Maine, Bangor, 16.5 and 21.5, Eastport, 18 and 15, Gardiner, 14.6 and 15.0, Lewiston, 20 and 21; Massachusetts, Concord, 14 and 10; Michigan, Alpena, 6 and 2, Detroit, 11 and 12, Port Huron, 10 and 7, Sault Ste. Marie, 9.5 and 15.0; Minnesota, Duluth, 24.0 and 24.5, Moorhead, 28 and 30, St. Paul, 23 and 20; Nebraska, Omaha, 11.0 and 7.5, Valentine, 21 and 19; New York, Albany, 10 and 8, Oswego, 15.5 and 17.0, Rochester, 9.5 and 11; North Dakota, Bismarck, 33 and 33, Williston, 24 and 34; Ohio, Cleveland, 9 and 6, Sandusky, 10 5; Pennsylvania, Erie, 10 and 11; South Dakota, Pierre, 20.0 and 22.5, Yankton, 20 and 22; Vermont, Brattleboro, 12.5 and 5.0; Wisconsin, Greenbay, 10.5 and 8.5, La Crosse, 13.0 and 7.5.

The ice broke up as follows: Connecticut River, Brattleboro, Vt., February 8; Missouri River, Hermann, Mo., February 8; Susquehanna River, Harrisburg, Pa., February 7, and Columbia, February 8.

Up to February 23, the ice harvest was good or excellent at Lewiston, Me., Dubuque and Sioux City, Iowa, and Harrisburg, Pa., and above Albany, N. Y.

In Canada.—Prof. R. F. Stupart publishes the following reports of the thickness of ice at the close of the month:

Northwest Territories, Battleford, 24 inches; Swift Current, 28; Regina, 30. Ontario, Port Arthur, 30 inches; Parry Sound, 15; Southampton, 23; Port Stanley, 10; Kingston, 15; Port Dover, 13; Stony Creek, 11; Orillia, 18; Lakefield, 20; Welland, 18; Midland, 17; Mattawa, 22; Smiths Falls, 16; Bayfield, 24; Sparrow Lake, 21; Clontarf, 30. Maritime Provinces, Chatham, 22 inches; St. Andrews, 32; Pictou, 18; Sydney, 12; Charlottetown, 12; Fredericton, 30.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 22. Arizona, 7, 9, 21. Arkansas, 1, 7, 22, 28. California, 1, 2, 11, 15, 18, 19, 20. Georgia, 1, 5. Illinois, 20, 21. Indiana, 20. Kansas, 21. Kentucky, 18 to 22. Louisiana, 1, 11, 15. Mississippi, 7, 12, 22. Missouri, 19 to 22, 25. Oklahoma, 3, 20. Oregon, 2, 8, 12, 13, 16, 17, 19, 20. South Carolina, 8, 13, 14, 17. Tennessee, 22. Texas, 3, 10. Washington, 7, 11, 12, 16, 20. West Virginia, 22.

SLEET.

The following are the dates on which sleet fell in the respective States:

Arizona, 12, 20, 21. Arkansas, 1, 3. California, 1, 2, 3, 14, 15, 17 to 21, 28. Colorado, 21. Connecticut, 3, 8, 15, 16, 20, 22, 23. District of Columbia, 2, 3, 8, 11, 12, 18, 20. Georgia, 1, 4, 25. Idaho, 4, 5, 10, 15, 16. Illinois, 1, 4, 5, 7, 8, 19 to 22, 28. Indiana, 1, 5, 11, 15, 20, 21, 22. Iowa, 3, 9, 10, 20, 21. Kansas, 3, 10, 11, 13, 21. Kentucky, 1, 2, 4, 8, 18, 26, 28. Louisiana, 23. Maine, 7, 14, 18. Maryland, 2 to 6, 11, 12, 20, 25. Massachusetts, 22, 23. Michigan, 5, 8, 11, 20, 21, 22. Minnesota, 3, 5, 13, 19, 20. Mississippi, 1, 4, 23, 24. Missouri, 3, 4, 5, 7 to 11, 14, 15, 20, 21, 22, 24, 25. Montana, 4, 12, 28. Nebraska, 6, 9, 10, 13, 14, 19, 20, 21, 28. Nevada, 1 to 5, 11, 12, 16. New Hampshire, 22, 23. New Jersey, 2, 3, 6, 8, 12, 15, 16, 20, 23. New York, 2, 6, 12, 15, 16, 20, 22, 23. North Carolina, 1, 2, 5, 20, 25. North Dakota, 3, 5, 15. Ohio. 1, 2, 5, 6, 8, 12, 14, 15, 18 to 22. Oklahoma, 4. Oregon, 2, 3, 11, 12, 15, 16, 20. Pennsylvania, 1, 2, 3, 5, 6, 11, 12, 14, 15, 16, 19 to 23. South Carolina, 1, 25 to 28. South Dakota, 3, 5, 9, 10, 11. Tennessee, 2, 4, 15, 18, 25, 26. Texas, 11. Utah, 1, 2, 12, 17, 19. Vermont, 16, 22. Virginia, 1, 2, 5, 6, 7, 11, 12, 18, 20, 21, 22, 26. Washington, 1, 2, 4 to 7, 10 to 13, 15 to 18, 21. West Virginia, 3, 5, 6, 11, 12, 18, 19, 20, 22. Wisconsin, 3, 5, 13, 20.

WIND.

The *prevailing winds* for February, 1897, viz, those that were recorded most frequently, are shown in Table I for the regular Weather Bureau stations.

The *resultant winds*, as deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table VIII. These latter resultants are also shown graphically on Chart IV, where the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a uniform wind of average velocity. These figures indicate the relative extent to which winds from different directions counterbalanced each other.

HIGH WINDS.

Maximum wind velocities are given in Table I, which also gives the altitudes of the Weather Bureau anemometers above the ground. Maxima of 50 miles or more per hour were reported during this month at regular stations of the Weather Bureau as follows (maximum velocities are averages for five